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Series B.

TAXONOMY

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COMMENTS AND ADDITIONAL NOTES ON PROFESSOR CARPENTER'S PAPER ENTITLED "NOTES ON *CHARAXES* (LEP. NYMPHALIDAE) IN THE HOPE DEPARTMENT OF ENTOMOLOGY, UNIVERSITY OF OXFORD"

By V. G. L. van Someren, F.R.E.S.

I have recently had the opportunity to study carefully the interesting communication by Professor Carpenter on the *Charaxes* in the Hope Department, University of Oxford (1945, *Proc. R. ent. Soc. Lond.* (*B*) **14** : 81–88). One or two points call for attention.

Under the heading *Ch. boueti macclounii* Rothschild and Jordan, reference is made to a specimen figured by me in 1928 (*J. E. Afr. Uganda nat. Hist. Soc.* **30**, pl. 67) as a variety of *Ch. boueti lasti* H. G. Smith, and the comment is that "the few words of description . . . are not clear." Although the dark markings are not so intense as in *lasti* and are more restricted, nevertheless these marks stand out more prominently owing to the less rich colour of the ground, hence my remarks that the marks are "more definite." Since this form or variety occurs in the area of typical *lasti*, I hesitated to apply the racial name *macclounii* Butler to these variants. I am inclined to support the suggestion that this variation is associated with the dry-season.

Ch. druceanus kivuanus Jordan.

Under this heading, Prof. Carpenter records a female specimen taken by the late Canon Rogers at Dabida, Teita range. In 1939 I obtained a small series of this species from the Teita Hills and described them as a distinct race under the name *teita* (1939, *op. cit.*, **14**, No. 3.). The Dabida female would thus be *C. d. teita*, rather than *d. kivuanus* Jordan.

Ch. numenes numenes Hewitson.

Carpenter records a specimen as taken at Nairobi in 1903 by A. H. Harrison. This locality is well outside the eastern limits of the species' range. To my knowledge no example has been taken east of the Rift during the last thirty-five years during which period I and others have collected extensively in Kenya. If the data are correct, the specimen must have been a stray.

Ch. achaemenes Felder.

Omitted by an oversight from my paper on *Charaxes*. We have records from the dry acacia country of Kibwezi, Teita and Taveta.

Ch. etheocles female form *ethalionoides* Carpenter.

Carpenter describes this form as new and cites a specimen in my collection as the type. The various forms of female *etheocles* and females of *ethalion* have given rise to much confusion, and though at the time of writing my papers I adopted the generally accepted grouping, subsequent investigation (museum and field) indicated that certain females

hitherto associated with *etheocles* were in fact *ethalion*. I possess a bred family of 21 specimens, 11 males and 10 females, the latter consisting of *rosae* (2 examples) and two forms with straight fore-wing bar—*i.e.*, the generally accepted typical female *ethalion* in which the sub-marginal white spots are coalescent with the discal white in 1a-2, and another form now called *ethalionoides* by Carpenter, the proportions being 5 to 2, and one intermediate. The series is placed in my collection as *ethalion*. Since, however, Carpenter described the less common form as *ethalionoides*, a female form of *etheocles*, I have made genitalia dissections of two of the males and they exhibit the characters of *ethalion*, not *etheocles*. These preparations, in a wet state, thus undistorted, were submitted to Dr. K. Jordan for an opinion. He reports that they are *ethalion*. The genitalia of *ethalion* can almost invariably be distinguished, but those of the several males usually lumped under *etheocles* (though some are designated by names, based on outward appearance) are not to be distinguished, a range of variation being common to them all.

Nevertheless such limited breeding as has been done indicates that certain males are definitely associated with certain females, and constantly so, and that there are two or more species in one area. I have given a general indication of this association in my review of the "*etheocles*" group (*op. cit.*) and would merely add that in the Bwamba region west of Ruwenzori the predominant male *catochrous* Staudinger is associated with a female which is intermediate in pattern and colour between forms *etheocles* Cramer, *violae* Butler and *vansomereni* Poulton.

A NEW SUBSPECIES OF *PAPILIO DARDANUS* BROWN

By Professor G. D. Hale Carpenter, M.B.E., D.M., F.R.E.S.

Papilio dardanus flavicornis subsp. n.

The Hope Department of Entomology at Oxford has recently received from Mr. T. H. E. Jackson, F.R.E.S., of Kitale, Kenya Colony, collections from the isolated mountain Kulal, situated some seventy-five miles to the east of the southern end of Lake Rudolf and reaching an elevation of 7,522 feet : the specimens were collected at about 5,600 feet. Among them were twelve males and three females with strongly yellow antennae, unknown in any other locality : I therefore propose the name *flavicornis*.

There are in the national collection at South Kensington one female and seven males of this form, taken on Kulal at 6,500 feet, 6.vii.1934, by the Rudolf Rift Valley expedition. This female is selected as the type specimen. In general coloration it is like those from Mount Marsabit, not quite one hundred miles to the south-east, to which Poulton (1924, p. 27) gave the form name *cenea-ochracea*.

The pale markings, in Poulton's words, differ from those of *cenea* in "the deep ochreous colour . . . harmonising with but somewhat paler than those of its model *Amauris lobengula septentrionis* Poulton." According to Ridgeway (1912) it comes nearest to his "yellow ocher" (Pl. xv). The distinguishing feature of all Kulal specimens of both sexes is the coloration of the antennae which, in museum specimens, have the club and under surface of the shaft of Ridgeway's "Ochraceous orange" (Pl. xv), and the upper surface of the shaft equal to "Ochraceous tawny" (*loc. cit.*).

The *type female* has its pale areas as follows :—

Upper Surface. Fore-wing : a narrow yellowish spot on the margin of each of areas 1*b*–5. Submarginal ochraceous spots in areas 1*b*, 2, 3, 7, the last transversely elongated and the largest. Discal series: A very large ochraceous patch filling the base of area 2 and extending outwards to the middle of the area ; posterior to its outer end a very dyslegnic, small, area of ochraceous suffusion in area 1*b* ; a rounded ochraceous spot at base of area 4 ; a more elongated ochraceous spot, proximally narrowed, in area 6. The subapical spot in area 7 is the palest on the wing. A rounded ochraceous spot at base of area 8. In the distal half of the cell a sinuous, narrow, ochraceous mark reaching from the anterior border to the mid-line of the cell.

Hind-wing : the basal pale area extends distally just beyond the apex of the cell. A very narrow ochraceous spot on the margin of each area at the end of the internervular ray. The series of paired ochraceous spots in the black band is complete, and well developed, the pair in area 2 the largest.

Under Surface. Fore-wing : the spots are larger, and the dyslegnic patch in 1*b* better defined. The spots are paler than on the upper surface, except the chief one, in area 2. The apex of the fore-wing, distal to the discal spots, is paler than the rest of the ground colour, which is blackish brown. On the hind-wing the black border is interrupted by an extension of the discal pale colour into area 5.

Type ♀. Kenya Colony : Mount Kulal, northern frontier, 6,500 feet, 6.vii.1934, Rudolf Rift Valley expedition. In British Museum (Natural History).

Paratypes. Three from same locality, 5,600 feet, February, 1946, *T. H. E. Jackson*, in Hope Department of Entomology, University Museum, Oxford.

Males. The twelve males in the Hope Department, and the seven in the British Museum, apart from the ochraceous antennae, are like lightly marked *tibullus* in appearance, rather than *polytrophus*. Similar in markings to a long series now received from Marsabit, they are on the whole slightly less heavily marked. (The Marsabit series will be considered in detail at a later date.) A certain number are of the aberration named by Suffert *maculatus*, with pale spots along the black border of the fore-wing. The discal H.W. band is never as broad as in typical *tibullus*, and is often interrupted by an incursion of yellow in areas 3 and 5. The series of marginal arched markings is also often interrupted, whereas it is continuous in typical *tibullus*. The black margins of the tail, which in typical *tibullus* fuse with the heavy central black marking along the vein at the base of the tail, often do not meet the central black. The following table summarises the characters :—

ab. *maculatus*	*H.W. black band*		*H.W. marginal black*		*Tail marginal black*	
63·1%	Interrupted	73·5%	Continuous	68·4%	Not fused	61·1%
	Complete	26·5%	Discont.	31·6%	Fused	37·9%

The male genital armature is like that of other East African races, with a long spine projecting upwards from the internal surface of the clasper.

Acknowledgments.

I am indebted to the Keeper of Entomology, British Museum (Natural History), for permission to examine the specimens under his care, and to Dr. B. M. Hobby for ascertaining that the name *flavicornis* is not preoccupied in *Papilio*.

References.

Poulton, E. B., 1924, *Proc. ent. Soc. Lond.* **1924** : xxvii–xxix.
Ridgway, R., 1912, *Color standards and color nomenclature*, Washington.

A NEW AFRICAN SPECIES OF THE GENUS *FULGORAECIA* NEWMAN (LEPIDOPTERA, EPIPYROPIDAE)

By W. H. T. Tams.

In 1913 H. W. Bell-Marley wrote an interesting account of the first species of Epipyropidae to be found in Africa, and the paper contains a description of the species by W. L. Distant, and a bibliography (1913, *Zoologist* (4) 17 : 281).

Mr. T. W. Kirkpatrick has just returned from Tanganyika Territory, with another African species, described below, and an account of its life-history, which will be published in these *Proceedings, Series A.*

Fulgoraecia cerolestes sp. n.

♂. Plate I, figs. 1, 1A, 4 ; genitalia, fig. 7.

Expanse 23–24 mm. Fore-wing fuscous, with fuscous black reticulate markings ; a cartridge buff spot close above the first anal vein directly below the junction of vein Cu 2 with the cell. Hind-wing fuscous black. Underside of fore- and hind-wings fuscous.

♀. Genitalia, plate I, fig. 9.

Expanse 21–23 mm. Fore-wing drab, with fuscous reticulate markings. Hind-wing fuscous. Underside of fore- and hind-wings fuscous.

Holotype ♂ and 3 ♂ paratypes, allotype ♀ and 6 ♀ paratypes Tanganyika Territory : Amani, bred March to May, 1945 (*T. W. Kirkpatrick*).

Hosts. Metaphaena cruentata Gerstaecker, on trunk of *Grevillea* (March–April, 1945). (Pl. 1, figs, 3, 3A, and figs. 5, 6, with larva of *Fulgoraecia cerolestes* Tams). *Metaphaena militaris* Gerstaecker on trunk of *Entandrophragma* sp. (May, 1945). (Pl. 1, fig. 2.)

A view of the female genitalia of *Fulgoraecia fulvipunctata* Distant, from Natal, is shown (Pl. 1, fig. 8) for comparison with fig. 9, *F. cerolestes* ♀.

The appearance of the generic name *Fulgoraecia* Newman after a century during which it has been completely overlooked, not to say avoided, may occasion some surprise. I give below a short history of the case.

At a meeting of the Entomological Society of London held on 7th August, 1848, Mr. J. C. Bowring exhibited ". . . a very remarkable Coccus-like insect, parasitic upon *Fulgora laternaria.*"

At a meeting of the same society held on 1st September, 1851, the following extract of a letter from Mr. Bowring, dated Hong Kong, 2nd June, was read :—

" Captain Champion tells me you entomologists at home will not believe my account of the parasite on *Fulgora.* Now yesterday I showed Mr. Harrington a specimen which I have just reared, the moth having

come out a day or two ago—a fine male, with beautifully pectinated antennae. The pupa-case with its cottony covering is well preserved. This specimen I intend to send to the Entomological Society."

This statement was repeated in the October number of the *Zoologist* for 1851, and the editor, Edward Newman, writing the preface for that year, dated 29th November, stated :—

" Many months have elapsed since a statement was made at one of the meetings of the Entomological Society, of a discovery made by Mr. J. C. Bowring at Hong Kong. This gentleman, who appears to have directed the energies of a very observant mind to the study of Entomology, detected on a specimen of the common Chinese *Fulgora*, a parasite which he believed to be Lepidopterous : it seemed to possess the wing-nervures and legs of a *Bombyx*, and the antennae of the male are described as beautifully pectinated (*Zool.* 3269). The existence of a Lepidopterous parasite is extremely curious, and although we should exercise a degree of caution in giving full credit to the statement of a fact so perfectly anomalous, yet there seems no reasonable ground in this instance for supposing that a mistake could have occurred through incomplete or inaccurate observation ; and I venture to express a hope that hereafter, when the characters of this insect shall have been more rigorously examined and defined, let its affinities be what they may, entomologists will kindly accede to the wish I have more than once expressed, of calling it *Fulgoraecia Bowringii*, thus making the name a lasting record both of its extraordinary economy and its talented discoverer."

At a meeting of the Entomological Society held on 1st March, 1852 :

" The President directed attention to the insects presented by Mr. J. C. Bowring, especially to the extraordinary parasite upon *Fulgora candelaria*, which was undoubtedly Lepidopterous, resembling a *Bombyx* or *Orgyia*, and for which Mr. Bowring proposed the name of *Epipyrops anomala*."

A quarter of a century later—1876—J. O. Westwood published a paper, editing J. C. Bowring's notes, and describing a new genus, new species *Epipyrops anomala*. He prefaced the actual description with the following observations :—

" The accompanying figures are drawn from Mr. Bowring's specimens, above described, in the British Museum, and others subsequently forwarded by that gentleman, now in the Hopeian Collection at Oxford, by whom also the manuscript name, subsequently adopted in this paper, was proposed, no description of the insect having hitherto appeared, so far as I am aware."

The bibliography given by Distant (1913, *Zoologist* (4) **17** : 290–291) contains no reference to Newman's name, which was also omitted by Scudder and subsequently by Neave.

That the name *Fulgoraecia bowringii* Newman is the first valid name for the species afterwards described by Westwood as *Epipyrops anomala* cannot be refuted. The family name will, however, remain EPIPYROPIDAE, as the name *Epipyrops* is still included in the synonymy of the group.

1
2
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1A
3A
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8
9

Explanation of Plate I.

Fig. 1.—*Fulgoraecia cerolestes* sp. n., 3 ♂ (enlarged).
Fig. 1a.—♂, to show actual size.
Fig. 2.—*Metaphaena militaris* Gerst. (enlarged).
Fig. 3.—*Metaphaena cruentata* Gerst. (enlarged).
Fig. 3a.—*Metaphaena cruentata* Gerst., to show actual size.
Fig. 4.—*Fulgoraecia cerolestes* sp. n., ♂ showing wings in resting position.
Fig. 5.—Ventral view of *Metaphaena cruentata* Gerst. with larva of *F. cerolestes* attached dorsally.
Fig. 6.—Dorsal view of example shown in fig. 5.
Fig. 7.—*Fulgoraecia cerolestes* sp. n., ♂ genitalia.
Fig. 8.—*Fulgoraecia fulvipunctata* Dist., ♀ genitalia, for comparison with those of the new species.
Fig. 9.—*Fulgoraecia cerolestes* sp. n., ♀ genitalia.

TWO NEW SPECIES OF DERMAPTERA FROM TURKEY

By Malcolm Burr, D.Sc., F.R.E.S.

Pseudisolabis kosswigi sp. n. (Pl. 1 and fig. 4)

Very dark blackish brown ; the whole body finely punctulate, except the head, which is smooth, the sutures indistinguishable ; a small brown spot behind each eye.

Antennae with 18 segments in the male, 10–11 in the female. Pronotum black, brown at the translucent edges, smooth, slightly inflated in the prozona ; median suture barely distinguishable, with a very small impressed spot on each side ; in the median line two very small impressed round points, and one triangular ; the pronotum is distinctly broader than long, flattened along the posterior margin ; in the female the impressions are fainter, except the small ones on each side of the median line. Totally apterous : legs slender, brown, with the generic characters. Prosternum about one and a half times longer than broad, parallel-sided ; in the mesosternum the borders are convex, the hinder margin truncate ; metanotum about half as broad again as long.

The abdomen is but slightly dilated, black, very finely punctulate, somewhat more pubescent in the female than in the male, the sides of the tergites smooth, the eighth and ninth slightly convex. Last tergite short and broad, with a faint median impression representing a suture, and slightly tumid over the insertion of the forceps in the male ; in the female simple, narrowed. Pygidium in the male a pointed tubercle. Subgenital plate in the male short, very broad, simple ; in the female similar, narrower, slightly more punctulate.

Forceps of the male thick at the base, remote, not trigonal but rounded, rather flattened on the under side, tapering regularly, bowed to enclose an approximately oval, heart-shaped area ; in the female, tapering, rounded, straight.

Length of body : male, 15 mm. ; female, 9 mm.

Length of forceps : male, 3 mm. ; female, 1·5 mm.

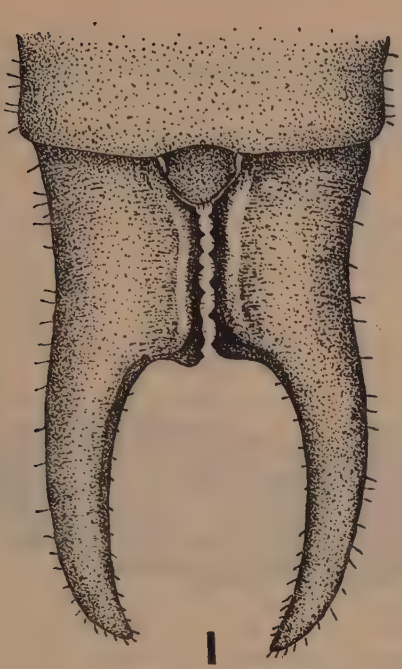
Turkey : Denizli, Honosdagh, under stone ; about 2,000 feet (*Kosswig*). The holotype male and allotype female have been deposited in the British Museum (Natural History).

The discovery of an undescribed species of Protodermaptera in the Palaearctic Region is something of an event, the interest and importance of which is enhanced by the fact that its congeners are known only from northern India, Java and New Zealand. Another point is that the species of the genus are so rare that, so far as I am aware, not more than a single pair of any one is known to exist in any collection.

The genus *Pseudisolabis* was established by me in 1908 (*Ann. Mag. nat. Hist.* (8) 2 : 254) for a new species, *Ps. walkeri*, from New Zealand, with rather negative characters. Closely related genera are *Parisolabis* Verhoeff with a single species from New Zealand, and *Parisopsalis* Burr, with a single species from Australia.

Pseudisolabis now contains the following species :—

Ps. walkeri Burr, New Zealand.
Ps. burri Borelli, Kashmir.
Ps. tenera Burr, Punjab.
Ps. immsi Burr, N. India.
Ps. renschi Günther, Java.
Ps. elegans Hebard, India.



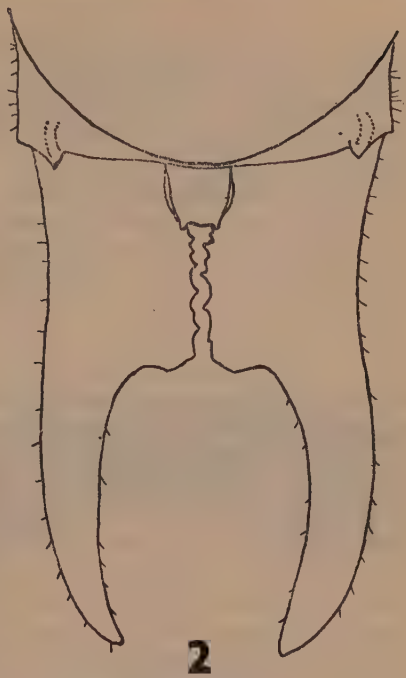


Fig. 1.—*Forficula hincksi* sp. n., ♂ forceps, dorsal aspect.
Fig. 2.—*Forficula hincksi* sp. n., ♂ forceps, ventral aspect.

When Professor Kosswig first reported his taking of a black apterous earwig, I thought it would probably turn out to be the scarcely known *Isolabella graeca* of Verhoeff, from Greece, as there is a good deal in common between the faunas of Greece and western Anatolia. But, according to Verhoeff's description, *Isolabella* is different in that the sutures of the head are very distinctly marked, whereas in this specimen, as in the genus *Pseudisolabis*, the head capsule is smooth, without a trace of discernible suture. Verhoeff's species remains a mystery. All I will say about it is that, many years ago, I went to Berlin on purpose to see the type, and found it dissected, merely a few pieces of chitin gummed to a card.

A comparison of the descriptions of the Indian species of *Pseudisolabis* with the Turkish specimen leads me to the belief that the three Indian forms are all variants of a single species, that the characters given are but individual features.

The Turkish specimen differs from all the others in its larger size, as the following table shows :—

	Body	*Forceps*
Ps. renschi, male	10·8 mm.	2·2 mm.
Ps. elegans, male	8·3–9 mm.	2·5 mm.
Ps. elegans, female	9–10·2 mm.	1·8–9 mm.
Ps. immsi, male	9·5 mm.	3·5 mm.
Ps. burri, male	9 mm.	2 mm.
Ps. tenera, male	11·5 mm.	1·5 mm.
Ps. walkeri, male	11·5 mm.	2 mm.
Ps. kosswigi, male	15 mm.	3 mm.
Ps. kosswigi, female	9 mm.	1·5 mm.

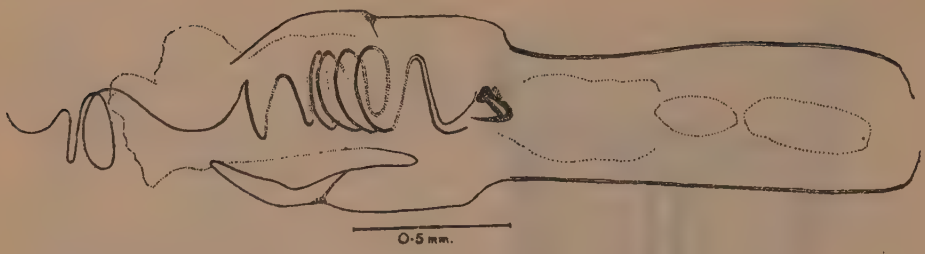


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Fig. 3.—*Pseudisolabis burri* Borelli, ♂ genitalia.
Fig. 4.—*Pseudisolabis kosswigi* sp. n., ♂ genitalia.
Fig. 5.—*Forficula hincksi* sp. n., ♂ genitalia.

A comparison of the descriptions of the species, in particular of the Indian forms, shows that the greater part of the space is given to generic characters and that the so-called specific distinctions are very doubtful, and I feel sceptical about their validity.

The new species differs not only in size, but in the form of the forceps. These are definitely not trigonal near the base (as they are in *Ps. renschi*), but almost circular in cross-section, being rather flattened on the under side. This feature distinguishes it also from *Ps. elegans*, in which the forceps are stated to be "subtrigonal." The shape of the area enclosed by the arms of the male forceps is often a very useful character in the Dermaptera, which retains a certain specific distinction in spite of an

often considerable range of variation. For instance, there is a *something* in the area enclosed in *Forficula lurida* which is at once recognisable from all the countless shades of variation in the very closely allied *F. auricularia*, figured statistically by Kuhl and reproduced by myself in *Discovery* (1939, 2 : 340–345) shortly before the war. In the same way, anyone who has ever seen an Australian specimen of *Labidura riparia* (the form *truncata*) can pick it out at a glance among a boxful of specimens. Yet these subtle differences are extremely difficult to describe, even in mathematical terms, and can be appreciated only by photographs or exceedingly accurate drawings.

The photographs of *Ps. kosswigi* (Plate 1) show at once the distinction from the forceps of *Ps. burri* as figured in my *Dermaptera* in the *Fauna of British India* series. On that species the branches are bent at an angle in the middle, so that the area enclosed is a transverse ellipse. In *Ps. immsi* the area is amost circular, judging from a sketch sent me by Mr. Hincks. As the photographs show, in *Ps. kosswigi* the area is rather heart-shaped.

Ps. kosswigi differs from *Ps. burri* in the less dilated abdomen and less strongly arcuate forceps, as well as in the larger size. From *Ps. tenera* it differs in the deeper colour and more strongly bowed forceps.

The discovery in south-western Anatolia of a sedentary, apterous insect with such remote relationships is a remarkable event that is on a par with certain other astonishing features about this surprising country. For instance, Professor Kosswig has told me that in Anatolia there are several species of fresh-water fishes distributed from as far away as Malaya and Sumatra, of the genera *Discognathus*, *Tylognathus* and *Paracyclocheilichthys*, which reach as far west as Denizli, and which were isolated by the disappearance in the early Pliocene of a relic of the ancient Tethys, which until then connected the Mediterranean with the Gulf of Oman, thus separating Arabia-Africa from India-Anatolia.

There is also the curious record of a bird with an overland east by west migration, *Pastor roseus*, which arrives in southern Anatolia in May to breed on the plateau and returns to the Punjab in August. Mr. Cowley tells me there is a dragonfly which ranges from Madagascar to Anatolia.

Professor Kosswig compares the following instances of relationship of Turkish creatures with the old Gondwana fauna : *Brahmaea cilicica* (Lepidoptera), from the S.E. Caucasus, Lenkoran and Tibet to S.E. Asia ; *Spelaeacritus*, a cavernicolous Histerid, from the Isaurian Taurus, with its nearest relatives in the Celebes, Hawaii (twenty-four species), the Seychelles (three species), two species in Europe (one of them in the Caucasus) and six in North America ; *Cereaxina* (ENDOMYCHIDAE, Col.) from the Taurus, also cavernicolous, with relatives in Madagascar, of which one is myrmecophilous. Turkey certainly still has plenty of surprises for the naturalist.

Pseudisolabis is clearly a Gondwana relict, in the sense discussed by Jeannel, with a type of distribution resembling that figured by him for the beetles of the genus *Lymnastis* (Bembidiini), a resemblance which would be more marked if species were more numerous, The fact that these earwigs are so rare in collections suggests that they are rare in

nature. Professor Kosswig found his pair each under a different stone by a mountain spring high up on Horoz Dagh, and stimulated by the discovery of what he realised was an interesting thing, he turned over a great many more stones, without finding another. If individuals are so few, it is obvious that the chances of the sexes meeting must be reduced, and so the rarity must be constantly increasing.

Supplementary Note.

In October, 1946, Professor Kosswig has found *Pseudisolabis kosswigi* at two other localities :

CHAVDIR, about ten hours' ride to the south of Denizli on the way to Horsum, at about 1,200 metres ; under the stones of an old ruin ; open country, not wooded. One male.

Between HORSUM and DIRMIL, about 1,400 metres. One male.

It seems as though the species is generally distributed through a considerable area in south-eastern Turkey, which is well known for its tertiary relicts. Professor Kosswig tells me that when he reached the coast on his journey southwards, he came upon an extensive forest of *Liquidambar*, which at that season was poor in life, but he brought back a single grasshopper, which appears to be *Tropidopola cylindrica* (Marsch.), or else a very closely related species, which is suggestive of Ethiopian affinities.

Forficula hincksi sp. n. (Figs. 1, 2 and 5)

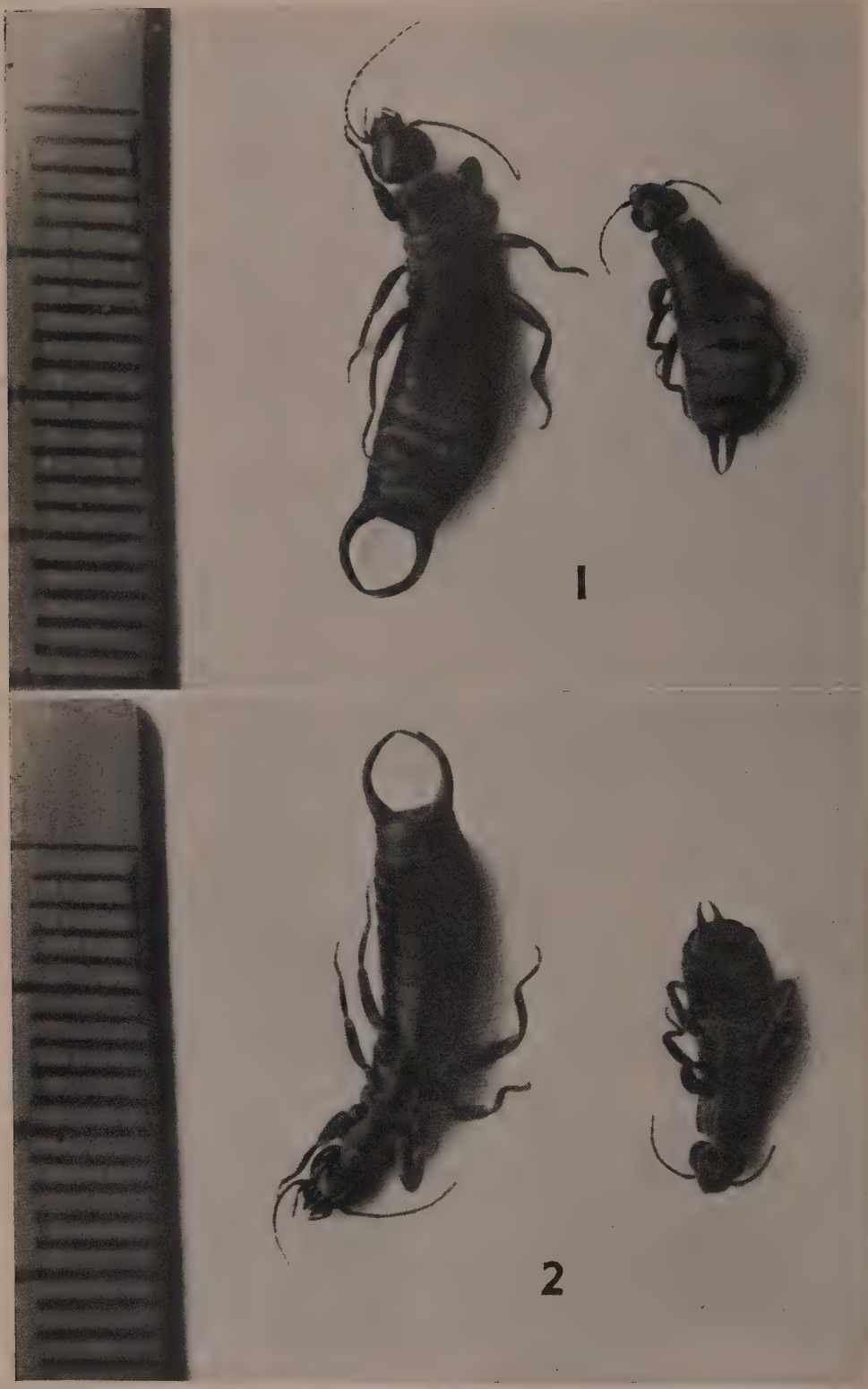
Almost hairless ; small ; reddish-yellow, darkening to deep brown posteriorly. Head light brown, smooth ; no sutures discernible. Antennae with 10–12 segments. Pronotum rectangular, distinctly broader than long, smooth. Elytra smooth, yellow, obliquely truncate posteriorly, considerably longer on the outer margin than the pronotum, the axillary angles rounded, just revealing the mesonotum beneath ; no trace of wings. Legs yellow, typically Forficuline.

Abdomen finely punctulate, reddish-brown at the base, darkening to deep chestnut at the ninth segment in the male, and seventh in the female ; lateral glands on third and fourth tergites prominent. Ventral surface of same texture and coloration as the dorsum. Last dorsal segment in the male transverse, rectangular, deep red, the posterior margin blackened ; no lateral keels ; dorsally, the margin is thickened and slightly raised on each side of the middle line, behind which there is a slight depression ; a small area on each side of the middle line is free from puncturation. Last sternite yellow in the male, pubescent, coloured as the dorsal surface. Pygidium of male prominent, seen from above polygonal, slightly broader than long, the sides concave near the base, then obtusely triangular, the actual tip rounded ; seen ventrally, slightly longer than broad, the sides gently convex, tapering to a truncate apex, with a small tubercle at each angle. In the female, square from both dorsal and ventral aspect, very slightly longer than broad, the corners sharp.

Forceps : in the male dilated for almost half the length ; this portion excavated to accommodate the pygidium, the inner face of the two branches then contiguous and denticulate, this portion ending in a blunt tooth ; from this point almost straight, tapering, gently incurved near the tips, which do not meet ; the area enclosed is an elongate oval : in the female the branches, after the basal excavation to accommodate the pygidium, are straight and tapering, the inner face minutely denticulate ; tips incurved.

Length of body : male, 9–11 mm. ; female, 9–13 mm.

Length of forceps : male, 2·5–3 mm. ; female, 2 mm.



M. Burr. **Pseudisolabis kosswigi** sp. n.

Turkey : Vilayet of Mersin : Korikos, between Mersin and Silifke. February, 1946. The type holotype male, allotype female and a female paratype have been deposited in the British Museum (Natural History).

Professor Kosswig found two males and five females, with ova, in association with *Forficula lurida*, under big stones on a threshing-floor about a quarter of a mile from the shore, at an altitude of about 300 feet.

This species belongs to the group of *F. pubescens*, *F. lesnei* and is typically Mediterranean in its associations ; it may well be vicarious with some of the species from Szechuan described by Bey-Bienko.

It is probably closely related to *F. aetolica* Brunner and *F. kaznakovi* Semenov, but I have no specimens of either available for comparison. From my recollection of a specimen of the latter that I took sweeping bracken at Notanebi, behind Batum, in 1915, and from a sketch of Bey-Bienko's, sent me by Mr. Hincks, I should say the pygidium and forceps are quite different. In that species they are of more graceful and elongate pattern, the dilated part much shorter, with no terminal thickening into a blunt tooth. As Bey-Bienko states that the pygidium and forceps are alike in *F. aetolica* and *F. kaznakovi*, it is clear that this new one is distinct, and so I dedicate it with pleasure to my friend Mr. W. D. Hincks, in recognition of the important work he is doing on the Dermaptera and the patient kindness with which he has laboriously satisfied my repeated demands for copies of descriptions and references to literature.

It is interesting to note that Professor Kosswig found both sexes living together under the same stone in the presence of eggs and freshly hatched larvae, probably of *F. lurida* as well. With *F. auricularia* this would not be possible, for they have a reputation for reckless cannibalism and oophagy.

Explanations of Plate 1.

Fig. 1.—*Pseudisolabis kosswigi* Burr sp. n., ♂ and ♀, dorsal aspect.

Fig. 2.—*Pseudisolabis kosswigi* Burr sp. n., ♂ and ♀, ventral aspect.

BRIEF NOTES ON THE GENITAL ARMATURE OF *PSEUDISOLABIS KOSSWIGI* AND *FORFICULA HINCKSI*

By W. D. Hincks, M.P.S., F.R.E.S.

Dr. Burr has kindly asked me to add a few notes to the foregoing paper on the genital armature of the two new species which he describes. He is unable to deal with this aspect himself without library facilities and comparative material. Dr. Burr has provided me with sketches of the genitalia (figs. 4 and 5) and recently with a fine male *P. kosswigi* from Chavdir. As far as I am able to do so with these materials I am glad to comply with his request.

A study of the genital armature in the present order is of the greatest taxonomic and phylogenetic importance in the lower or Labiduroid families, but in the Forficuloids these characters appear to offer less assistance to the systematist due to the close similarity which exists between the genitalia of even supposedly widely distinct genera.

Pseudisolabis Burr, 1908.

The armature of the Labiduroid genus *Pseudisolabis* has not been figured previously. Dr. Burr's sketch (fig. 4) is here reproduced together with an illustration (fig. 3) prepared from a specimen of *P. burri* Borelli, 1909, from my own collection. Bey Bienko (1935, *Wiss. Ergebn. Niederl. Exp. Karakorum, Zool.* : 209) has synonymised *P. burri* from N.E. Cashmire and *P. tenera* Burr, 1910, from the Punjab, after a careful examination of a variable series of both sexes from Cashmire. I have no doubt that this synonymy is correct. In 1923 Hebard (*Mem. Dept. Agric. India* 7 : 212) states, in reference to *P. elegans* Hebard, 1917, "This species agrees with *P. tenera* Burr, in coloration, and with *P. immsi* Burr in the form of the male forceps. It is possible that all may eventually prove to be variants of one species. If two valid species alone survived, however, it is possible that these would be *P. burri* Borelli and *P. immsi* Burr."

The pair in my collection are from India : United Provinces, Chakrata, 8,000 feet, Dehra Dun, 5.vii.1945, under stones, *Jai Krishna Unyal.* They agree well with the descriptions of *P. tenera* and *P. elegans*, but the male is somewhat intermediate between the two in the length of the forceps, the curvature of which agrees with that illustrated for Hebard's species (1917, *Proc. Acad. nat. Sci. Phila.* 69 : pl. xvi, fig. 2). I have no doubt that *P. elegans* is merely a synonym of *P. burri* and I am therefore using the latter name for the present specimens.

The genitalia of the two species of *Pseudisolabis* here illustrated have a very remarkable character in common ; they have only a single functional penis. This is indeed a surprising condition for a Labiduroid, a primary character of that superfamily being the presence of paired penis lobes. It is not without precedent, however, for one lobe to be suppressed, and this occurs in the Pygidicranidae, in the African

KARSCHIELLINAE (nine species) and in the Malagasy *Isopyge madagascariensis* Borelli, 1931. These are the only exceptions, and since the remaining three genera of the PARISOLABINAE have normal paired penis lobes the matter is of some interest. Unfortunately, as Dr. Burr has already pointed out, material of this genus is exceedingly rare and the pair of *P. burri* and single male *P. kosswigi* already mentioned are the only examples of the present subfamily at hand. It is also unfortunate that the single mount I possess of the former species is not in good condition; the penis is in erection and consequently obscures the parameres and distorts the virga.

In order that the armature of the Chavdir male of *P. kosswigi* might be thoroughly examined it was not mounted in the usual manner, but was placed in a drop of glycerine at the bottom of a small glass tube (5×25 mm.) closed with a cork by means of which it could be attached to the pin of the earwig. This enables the genitalia to be removed to a drop of glycerine on a slide for free examination at any time. In consequence of the ability to turn the organ freely I was able to distinguish a vestigial digit-like second penis lobe which is extremely difficult to observe in a specimen cleared and mounted in the usual manner and which has been overlooked in figs. 3 and 4.[1] This aborted lobe is smaller than its metaparamere and when in position is difficult to distinguish from the proparamere upon which it rests. Its true nature becomes apparent, however, when lifted with a needle and the small enclosed vesicle and rudimentary virga are then easily seen.

The mount of *P. burri*, on re-examination, shows a darker area in the correct position which is no doubt the virga of an aborted second penis lobe, unnoticed at the time fig. 3 was prepared.

The reduction of one penis lobe is analogous to the condition found in the KARSCHIELLINAE, where a similar vestigial virga is also observable. The reduced lobe, however, is the opposite one to that in the present instance.

Besides the agreement in respect of the penis, the two species of *Pseudisolabis* both have a long convoluted virga, a further character distinguishing them from the other genera of the PARISOLABINAE. Of the latter, *Parisolabis* Verhoeff; 1904, has a rather short, straight virga with a well-marked vesicle. *Idolopsalis* Borelli, 1910, has a long, straight virga, whilst that of *Parisopsalis* Burr, 1914, is very short indeed. Both species of *Pseudisolabis* figured here have a heavily chitinised area at the outer side of the junction between the meta- and pro-parameres. The two species appear to differ markedly in the outline of the metaparameres. In *P. burri* these are much more slender than in *P. kosswigi*.

The opisthomeres are all present and distinct in *P. kosswigi*, the metapygidium and telson being distinct from but smaller than the relatively large pygidium. The manubrium of the ninth sternite is long and reminiscent of that of the CARCINOPHORINAE (*Psalidinae auctt.*) (see Burr, 1915, *Trans. ent. Soc. Lond.* 1915 : pl. xxxii), though it is not so remarkably developed as in that group. It may be mentioned,

[1] Indications of the aborted penis-lobe are discernible in fig. 4.

incidentally, that the Chavdir male of *P. kosswigi* has 21 antennal segments on one side and 17 on the other, broken, antenna. Burr gives 18 as the number in his description on page 60.

In all characters excluding the genitalia *Pseudisolabis* agrees with the position hitherto assigned to it as a member of the family LABIDURIDAE. Whether it should be dissociated from the other genera now placed with it in the subfamily PARISOLABINAE can only be decided by an examination of more extensive materials than are at present available.

Forficula hincksi Burr.

The male genitalia in the genus *Forficula* have not proved to be of any great value in the discrimination of the species. There is very little difference in this respect between the species and such as exists may well be due to purely individual variation. No one has yet examined a sufficient number of examples to be able to decide whether the subtle differences in the shape of the parameres, the structure of the praeputial sac and the virga, are really significant in this regard. There is one character shown in Dr. Burr's drawing of the genitalia of *F. hincksi* which may be mentioned and that is the presence of an armature of small chitinous teeth on the praeputial sac. Although omitted from the illustrations of Burr (1916, *J. R. micr. Soc.* pl. iii) and by Bey-Bienko and other authors, this character is shown in each of the seven Italian species of the genus figured by Maccagno (1933, *Boll. Mus. Zool. Anat. comp. Torino* (3) **43** : 285-292).

Note.—The sketches by Dr. Burr, to which Mr. Hincks refers in this paper, are reproduced in Dr. Burr's own immediately preceding paper (1947, *Proc. R. ent. Soc., Lond.* [*B*] **16**, 60-65).—Ed.

CERATOPOGONIDAE FROM THE ANGLO-EGYPTIAN SUDAN

By J. W. S. Macfie, M.A., D.Sc., M.B., Ch.B.

By courtesy of the Director of the Imperial Institute of Entomology and of Prof. P. A. Buxton of the London School of Hygiene and Tropical Medicine, I have recently had the opportunity to examine a number of Ceratopogonidae collected in the Anglo-Egyptian Sudan. A record of the species found may be of interest as an indication of the nature of the insect fauna in this region, and because it will extend the known range of distribution of a number of species. The collections comprise a total of 2,084 specimens, but most of them were taken on two days—namely, 1,550 on 28th January, 1946, at Wad Medani, "at light" (*H. W. B. Barlow*), and 214 on 8th February, 1946, at Rier, "on steamer at light" (*D. J. Lewis*). It should be explained here that in the references to these specimens in the text the names of the two collectors and their field notes are usually omitted to avoid constant repetition. No record of biting accompanies them. The great majority (1,157) of the Wad Medani specimens are indeed females of *Forcipomyia egypti* Macfie. Only one male was taken with them, and one inter-sex form. The females show a great range of variation in size, and considerable differences in colour. In contrast to this species, 88 out of the 144 specimens taken of the remarkable *Atrichopogon aegyptius* Kieffer are males, and only 56 females.

Altogether more than thirty different species are represented in the collections, and of these four, I believe, have not previously been described—namely, a *Forcipomyia*, a *Culicoides*, an *Alluaudyomia*, and a species belonging to the *Palpomyia* group of genera. Most of the others are species known to be widely distributed in the Ethiopian region.

The unit used in the descriptions of the new species is approximately 3·7μ. All the types of these new species are in the British Museum (Natural History).

Holoconops kerteszi (Kieffer).

Wad Medani, 1.iii.1943, 5 ♀; 6.iii.1943, 1 ♀ (*D. J. Lewis*); Er Kowit, 17.v.1943, 10 ♀ (*D. J. Lewis*); Kamaran, 1944, 4 ♀ (*P. Grigg*).

Forcipomyia biannulata Ingram and Macfie.

Wad Medani, 28.i.1946, 1 ♂; Rier, 8.ii.1946, 3 ♀.

Forcipomyia corsoni Macfie.

Wad Medani, 28.i.1946, 1 ♀.

This small species resembles *F. ingrami* superficially, the wings having much the same appearance. The T.R. is, however, greater, about 2·3, and there is only a single retort-shaped spermatheca.

Forcipomyia egypti Macfie.

Wad Medani, 1.iii.1945, 3 ♀, on "dead guineapig" (*D. J. Lewis*); 28.i.1946, 1 ♂, 1,157 ♀, and one inter-sex form, "at light" (*H. W. B. Barlow*); and 1.ii.1946, 1 ♀, "in house, evening, sucking water-melon juice" (*D. J. Lewis*); and 30.xi.1946, 15 ♀ "at light" (*D. J. Lewis*); and Rier, 8.ii.1946, 5 ♀.

This species should perhaps be regarded as a form of *F. ingrami* Carter. A comparison of the specimens with a female taken in West Africa shows, however, that there is an appreciable difference in the form of the antennae. In the specimens taken at Wad Medani (and in those taken at Cairo and indentified by me in 1944 as *F. ingrami*, which agree with them) the terminal segments (11–15) are slightly shorter, and the change of shape between segments 10 and 11 is less distinct, so that the antennae are clearly shorter, less than half instead of half the length of the wing (28 : 65 in one specimen instead of 32 : 65). It was especially because of this character of Egyptian specimens, the fact that in them the segments of the flagellum form an almost continuous series, that I separated them (1924) as a distinct species and proposed for them the name *F. egypti*. It may be convenient to retain this name for them. *F. ingrami* as at present understood is a variable (in size, colour, and form) and widely distributed species which may well prove to have developed distinct races in different parts of the world. Indeed, there are in the literature a very considerable number of species which seem to be either the same as *F. ingrami* or a race of that species, or are so similar that without additional details they cannot be distinguished from it. The females have no very definite features and form, indeed, a sort of residue in many collections after all other species have been sorted out. They are brown insects without any notable colour markings, the antennae are dark, the basal segments (4–10) of the flagellum sub-spherical to oval and forming a more or less continuous series with the more cylindrical distal segments, the wings are unadorned and rather densely clothed with macrotrichia, the T.R. is a little more than 1, and there are two sub-spherical spermathecae tapering more or less towards the duct which is itself not chitinised for any great distance.

Forcipomyia inornatipennis (Austen) var. *ornaticrus* Ingram and Macfie.

Wad Medani, 25.v.1940, 12 ♀, on "window screening" (*D. J. Lewis*).

Forcipomyia lepidota Ingram and Macfie.

Rier, 8.ii.1946, 21 ♀.

This determination requires confirmation by examination of males. It should be noted that the wings are often denuded and their adornment therefore obscured. There can be but little doubt that *F. lepidota* is the same as *F. chrysolopha* (Kieffer).

Forcipomyia sudanensis sp. n.

A darkish brown species without scales, with unadorned wings, with pale brown legs only the hind pair of which are slightly infuscated on both sides of the knees, and with the T.R. about 1.

Male and female. Length of wing about 1·1 to 1·4 mm. ; greatest breadth about 0·4 to 0·5 mm.

Head dark or very dark brown. Eyes of female broadly contiguous above. Palpi darkish brown in female, pale brown in male ; third segment about as long as sub-equal fourth and fifth together, narrowed anteriorly, inflated at base, with deep pit having a circular orifice. Antennae in female dark brown, in male paler brown excepting torus which is very dark. In male (fig. 1) plume scanty, pale brown ; segments unusual, 4–10 confluent, bearing plume, ranging in one specimen from 11 by 12 to 6 by 7 units ; 11 small, detached, about 5 by 5–6 units; 12 sub-cylindrical, about 13 by 5–6 units ; 13–15 elongate, sub-equal in length, about 40 units, the fifteenth ending in a nipple-like process. In female segments 4–10 oval, slightly constricted at apex, ranging in one specimen from about 12 by 11 to 12 by 8 units, armed with brownish, curved, bluntly-pointed spines about the same length as the segments ; change of shape between 10 and 11 not very great, but 11–14 somewhat more vasiform with short neck, sub-equal, about 14–17 by 8–10 units; 15 longer, about 25 by 8 units, ending in a nipple-like process. The combined lengths of segments 3–10, 4–10, and 11–15 in this specimen about 105, 90, and 84 units respectively.

Thorax dark or darkish brown, paler in male than in female, with traces (best seen when mounted) of the usual antero-posterior bands. Scutellum slightly paler, and post-scutellum decidedly darker than scutum, the former bearing numerous bristles and hairs.

FIG. 1.—*Forcipomyia sudanensis* sp. n. : segments 10–13 of antenna of male.

Wings unadorned, well but not densely clothed with macrotrichia ; without scales. Venation normal : first radial cell obsolete, second quite small. Costa reaching almost to middle of wing in both sexes ; fork of Cu at almost same level as end of costa. Halteres with whitish knobs.

Legs almost uniformly pale brown, but femora and tibiae of hind legs somewhat diffusely infuscated on both sides of knees ; without scales or modified bristles. Form of segments, claws, and empodium normal. First and second tarsal segments about equal on all legs. T.R. in both sexes about 1.

Abdomen dark brown in female, paler brown (especially proximally) in male. Spermathecae two, very dark brown, oval, sub-equal, about 57μ by 40μ ; chitinised portion of duct curved, rather long, about 15–20μ. Hypopygium paler brown than distal segments of abdomen, somewhat similar to that of *F. castanea* (Walker). Ninth sternite only slightly excavated in middle line posteriorly, bearing numerous bristles. Side-pieces with very long root-like processes which articulate with harpes. Claspers with strong, infuscated, claw-like ends. Harpes similar to those of *F. castanea*, their distal ends bent ventrally, tapering to points, reaching posteriorly to a little beyond level of ends of side-pieces. Aedeagus feebly chitinised, broad, shield-shaped, with a median point posteriorly, and generally similar to that of *F. castanea*.

ANGLO-EGYPTIAN SUDAN : Hawata, xii.1942, 7 ♂, 4 ♀ (*D. J. Lewis*) ; and Wad Medani, 28.i.1946, 1 ♂, 2 ♀, "at light" (*H. W. B. Barlow*).

The characters given in the short diagnosis of this species will suffice, I think, to distinguish it from any other hitherto recorded from Africa. In addition, the form of the antennal segments and of the hypopygium will facilitate identification should males be available for examination.

The single male *Forcipomyia* taken by me at Dire Daua, Ethiopia, and tentatively assigned by me (1937) to *F. lasionota* (Kieffer), although larger (length of wing 1·6 mm.), may have belonged to this species or to some other closely allied species. It can hardly, I now think, have been an example of *F. lasionota* because in that species the second tarsal segment of the hind legs is nearly three times as long as the first (T.R. therefore about 0·3).

Atrichopogon.

The collections include 237 specimens of this genus, 93 males and 144 females, which may be separated into species in the manner detailed in the key which follows. The long series of specimens taken at Wad Medani make it possible to define exactly the characters of both sexes of *A. aegyptius* Kieffer, and to establish its synonymy. But it is not possible, I think, to correlate the other males with females: and it should be understood that some of the distinctions given in the key may be more apparent than real, and that in any case when dry it is well-nigh impossible to separate some of the different forms. Under these circumstances I think it inadvisable at present to burden the literature with any new names.

Key to the species of *Atrichopogon.*

1. Scutellum very dark brown or blackish 2
   Scutellum paler, yellowish 4
2. Blackish species: in female length of wing about 1·3 mm., with macrotrichia only at tip, but fairly numerous in cells R 5 and M 1; antennae very dark, basal segments (4–10) not much flattened, from about 7 by 9 to 8 by 8 units
   Sp. 1 (nr. *africanus* I. & M.)
   Very dark brown or blackish species: in female length of wing about 1·0 mm., with macrotrichia more scanty than in preceding species, very few or none in cell M 1; antennae dark brown, with basal segments more flattened 3
3. Basal segments (4–10) of antennae of female moderately flattened, from about 4 by 7 to 6 by 6–7 units; wings with macrotrichia at tip of wing in cells R 5 and M 1; eyes rather densely hairy Sp. 2
   Basal segments of antenna of female more flattened, from about 3 by 8 to 5 by 7 units; wings with only a very few or no macrotrichia at tip; eyes less densely hairy, almost bare . . *homoius* I. & M.
4. Females: length of wing 1·2–1·5 mm. Wings with macrotrichia all round periphery and along veins. Thorax with at least traces of usual dark brown antero-posterior bands on scutum. Antennae dark brown or blackish 5
   Males: length of wing 1·2–1·3 mm. 8
5. Wings with macrotrichia abundant, covering whole surface excepting basal areas and numerous in anal cell; rather variable, but in cell R 5 extending basally at least to level of middle of second radial cell. Spermathecae two, oval, about 90μ by 75μ, with narrow duct chitinised for a considerable distance, 30–40μ
   aegyptius Kieffer.
   Wings with macrotrichia scanty, but few in anal cell, and in cell R 5 not reaching beyond level of end of costa 6

6. Basal segments (4–10) of antenna somewhat flattened, from about 5 by 9 to 6 by 8 units. Spermatheca single, oval or somewhat pyriform, about 83μ by 61μ, the duct chitinised for only a very short distance . . . . . Sp. 4
   Basal segments of antenna not flattened 7
7. Spermatheca single, oval or sack-like, about 75–90μ by 45–50μ (maximum), with practically no part of duct chitinised . . Sp. 3
   Spermatheca single, more pyriform, tapering towards duct, about 75–80μ by 50–60μ (maximum) . ? *aegyptius* (M. 1944, not Kieffer.)
8. Wings with numerous macrotrichia at tip. Hypopygium remarkable, unusually large and broad, with ends of claspers roughly T-shaped . . . . . *aegyptius* Kieffer.
   Wings without macrotrichia 9
9. Very dark species with scutum and torus very dark brown or blackish. Fork of Cu at almost same level as that of M, only slightly more distal; hypopygium with ninth sternite deeply excavated in middle line posteriorly, bearing (usually) 2 bristles on each side; aedeagus with root-like processes short, stout, everted at ends . . . . . Sp. 5
   Scutum and torus not so dark. Fork of Cu clearly distal to level of that of M; hypopygium with ninth sternite not deeply excavated, bearing more numerous (6 or more) bristles on each side; aedeagus with root-like processes longer, more slender, with less everted ends . . . . . Sp. 6

Atrichopogon aegyptius Kieffer.

Wad Medani, 28.i.1946, 88 ♂, 56 ♀. This is a dull brown species with a yellowish scutellum, hairy wings, and the end of the abdomen yellowish in both sexes. Kieffer described both the male and the female from specimens taken in Egypt. The females taken in Egypt which I suggested (1944) might belong to this species clearly do not do so. Their wings bear many fewer macrotrichia. They are more closely akin to the species referred to here as *A.* sp. 3. There can be no doubt, I think, that the females taken by me in Egypt which I supposed (1924) might be *A. atriscapula* Kieffer, and the single male taken at Onderstepoort and described by de Meillon (1943) as *A. phrixus*, are in fact *A. aegyptius*.

Atrichopogon homoius Ingram and Macfie.

Wad Medani, 28.i.1946, 1 ♀. This specimen agrees well with those taken at Cairo which in 1944 I referred to this species. One wing is damaged, the other bears almost no macrotrichia, only a few at the end of the vein M 1.

Atrichopogon sp. 1.

Rier, 8.ii.1946, 48 ♀. These very dark brown or blackish insects are probably the same as the West African *A. africanus* Ingram and Macfie, but are apparently much darker in colour. I have compared them with a female taken in the laboratory at Accra, 31.xii.1921, labelled by Dr. Ingram A. *africanus*. They agree with it in almost every respect, but are blacker, and the legs by contrast are rather more yellowish-brown.

Atrichopogon sp. 2.

Rier, 8.ii.1946, 6 ♀. These insects resemble closely *A. homoius*, but the basal segments of the antenna are rather less flattened, and the wings bear rather more numerous macrotrichia.

Atrichopogon sp. 3.

Rier, 8.ii.1946, 14 ♀. It is probable that this is a new species differing from any other previously described from Africa. It resembles very closely the species which in 1944 I suggested (subject to confirmation by examination of males) might be *A. aegyptius*; indeed, the only difference I have been able to detect is the rather unsatisfactory one of the slight dissimilarity in the shape of the spermatheca. The two should perhaps be regarded as forms of a single species.

Atrichopogon sp. 4.

Rier, 8.ii.1946, 19 ♀. This species resembles rather closely the West African *A. xanthoaspidius* Carter, Ingram and Macfie, but the single spermatheca is much smaller, measuring about 81μ by 63μ instead of about 120μ by 49μ, and more pyriform in shape.

Atrichopogon sp. 5.

Rier, 8.ii.1946, 3 ♂.

Atrichopogon sp. 6.

Rier, 8.ii.1946, 2 ♂.

Dasyhelea inconspicuosa Carter, Ingram and Macfie.

Wad Medani, 28.i.1946, 3 ♂, 3 ♀; Rier, 8.ii.1946, 1 ♀.

All these specimens are probably examples of the variety of this species for which I proposed (1944) the name *egypti*.

Culicoides austeni Carter, Ingram and Macfie.

Rier, 8.ii.1946, 1 ♂, 72 ♀.

Culicoides (?) *bedfordi* Ingram and Macfie.

Wad Medani, 28.i.1946, 1 ♀. This specimen is probably the same as *C. bedfordi*, a species originally taken in the Transvaal, but the wings bear fewer macrotrichia, those between M and Cu scarcely extending proximally beyond the level of the end of the costa, and the spermathecae are rather feebly chitinised. The identification therefore requires confirmation by examination of other specimens, especially males.

Culicoides distinctipennis Austen var. *egypti* Macfie.

Rier, 8.ii.1946, 11 ♀. De Meillon (1943) considers this species to be the same as *C. praetermissus* Carter, Ingram and Macfie.

Culicoides fulvithorax (Austen).

Li Rangu, 29.vi.1946, 2 ♀.

Culicoides grahami Austen.

Li Rangu, 29.vi.1946, 126 ♀, and x.1946, 64 ♀ (H. M. Woodman).

Culicoides milnei Austen.

Lagawa, viii.1945, 5 ♀; and Li Rangu, 29.vi.1946, 2♀.

Culicoides neavei Austen.

Fangak, 15.i.1940, 1 ♀, "steamer, bit" (*D. J. Lewis*).

Culicoides pallidipennis Carter, Ingram and Macfie.

Erkawit, v.1941, 1 ♀ (*F. W. Andrews*); Lagawa, viii.1945, 11 ♀; and Rier, 8.ii.1946, 3 ♀.

Culicoides pycnostictus Ingram and Macfie.

Wad Medani, 28.i.1946, 1 ♂.

Culicoides schultzei (Enderlein).

Merebea, 7.v.1940, 3 ♀ (*E. Jane*); Wad Medani, 27.xii.1944, 2♂, 1 ♀; 31.xii.1944, 6 ♂, 2 ♀; 21.xii.1945, 1♀, "bit man" (*D. J. Lewis*); 28.i.1946, 53 ♂, 164 ♀ (*H. W. B. Barlow*); and 30.xi.1946, 6♂, 6♀, "at light" (*D. J. Lewis*); and Lagawa, viii.1945, 1 ♀.

Culicoides similis Carter, Ingram and Macfie.

Katena, xi.1943, 1 ♀ (*C. M. Macdonald*); Wad Medani, 28.i.1946, 2 ♂, 4 ♀; and 30.xi.1946, 3 ♂, 4 ♀, "at light" (*D. J. Lewis*).

Culicoides fuscicaudae sp. n.

A brown species of medium size with unadorned wings, the thorax and the end of the abdomen dark brown, darker than the more proximal segments of the abdomen, the third segment of the palp very large and greatly inflated, and the two spermathecae deeply pigmented, with a short part of the duct chitinised.

Female. Length of wing 0·9–1·2 mm.; greatest breadth about 0·4 mm.

Head very dark brown or blackish. Eyes apparently bare. Palpi rather dark brown: third segment large, greatly inflated, with a very large, shallow pit; lengths of last three segments in one specimen 21, 7–8, and 8–9 units respectively. Antennae brown, torus not much darker than other segments: segments 4–10 sub-spherical, from about 5–6 by 7 to 7 by 6 units; 11–15 more elongate, 11–14 sub-equal, about 10–11 by 5–6 units; 15 rather longer, about 17 units, tapering distally but without stylet. The combined lengths of segments 11–15, 3–10, and 4–10 about 58, 45, and 37 units respectively.

Thorax with scutum very dark brown, not spotted, but with traces of usual antero-posterior bands. Scutellum brown, somewhat paler than scutum, bearing 4 bristles and a few (4) small hairs.

Wings unadorned. Venation and distribution of macrotrichia practically as in *C. inornatipennis* C. I. and M. Halteres with pale brown or nearly white knobs.

Legs rather pale brown, almost uniformly coloured. T.R. about 2.

Abdomen rather pale brown, but with tip darker: segment 8 entirely dark brown, segment 7 with semicircular dark brown area in middle of sternite. Cerci pale brown. Spermathecae 2, very dark and highly chitinised, sub-spherical or oval but tapering towards duct, sub-equal, about 40–55μ by 35–45μ, the duct chitinised for a short distance, 10–15μ.

Anglo-Egyptian Sudan. Wad Medani, 28.i.1946, 6 ♀, "at light" (*H. W. B. Barlow*). It is here also that two additional females taken at the same place and at the same time should be mentioned. They resemble the above species closely and may perhaps be just immature or teneral forms of it, but the end of the body is pale like the rest of the abdomen, not at all darkened, and the two spermathecae which are otherwise similar are rather feebly chitinised as is also the chitinised commencement of the duct.

A number of species (about 17) of *Culicoides* with unadorned wings have been described which must be kept in mind when examining specimens from the Anglo-Egyptian Sudan. Some of them, *C. scotti* Kieffer (which is perhaps a *Dasyhelea*), *C. aurantiacus* Kieffer, and its variety *C. mahensis* Kieffer, all found in the Seychelles, are clearly not *Culicoides* at all. About some, such as *C. vitreipennis* Austen and *C. puripennis* Austen, the descriptions of which are based on the colours of dried specimens, there must always be uncertainty unless the types have been preserved and can be re-examined. Others are probably synonyms (for example, *C. arenarius* Edwards, 1922 which, from the description, cannot I think be distinguished from *C. rutilus* Ingram and Macfie, 1921), for often only one sex is known, and too much importance

has perhaps been attached to mere differences in size and colour, both characters which in some species at any rate (*e.g.*, *C. inornatipennis* Carter, Ingram and Macfie) are liable to great variation.

Apart from the adornment of the wings and the form of the hypopygium and its component parts, differential characters are not conspicuous in the genus *Culicoides*. In this instance therefore, as the wings are unadorned and only the female is known, the difficulty is increased. The species described above belongs to a group, including *C. ravus* de Meillon, *C. judaeae* Macfie, and the species which in 1943 I suggested might be the same as *C. vitreipennis* Austen in which the females have the third segment of the palp greatly inflated and the scutum dark brown in colour. It differs from the other members of the group in the form and degree of chitinisation of the spermathecae and of the commencement of the duct, for in *C. ravus* the spermathecae are pyriform, unusually large (60μ by 40μ), and completely unpigmented, and in *C. judaeae* and *C. vitreipennis* no part of the duct is chitinised. It differs too in the conformation of the end of the abdomen as described above.

Alluaudomyia maculithorax (Carter, Ingram and Macfie).

Rier, 8.ii.1946, 1 ♂.

Alluaudomyia marmorata (Carter, Ingram and Macfie).

Rier, 8.ii.1946, 2 ♀.

Alluaudomyia melanosticta (Ingram and Macfie).

Wad Medani, 28.i.1946, 1 ♂.

Alluaudomyia polyommata sp. n.

A blackish species with the thorax spotted, and the wings adorned much as in *A. wansoni* de Meillon, but with fewer macrotrichia.

Female. Length of wing about 1·3 mm., greatest breadth 0·5 mm.

Head almost black. Eyes apparently bare. Palpi darkish brown, third segment hardly at all inflated, with very small sub-apical pit. Antennae with torus dark brown, flagellum paler brown but segments infuscated distally: form of segments as in *A. wansoni*, but 14 and 15 missing.

Thorax blackish, spotted. Scutellum yellowish, but partly infuscated.

Wings conspicuously adorned with black spots that are irregularly ringed with white. Arrangement of spots almost exactly as in de Meillon's figure of *A. wansoni*, but dark area involving cross-vein rather darker, and spot at base of M2 rather larger. No dark spot immediately distal to cross-vein as in *A. melanosticta* I. and M., no dark spot between M and Cu just proximal to level of cross-vein, and no small dark marks at extremities of veins. Venation also similar to that of *A. wansoni*, but macrotrichia more scanty, distributed sparsely over the wing membrane and veins distal to level of end of costa and over posterior border of anal cell, but leaving well-defined bare areas along veins. Halteres with blackish knobs.

Legs largely very dark brown. Femora with narrow, pale, subapical band; tibiae with similar band near both base and apex, the latter wider on hind pair. Knees all dark. Segments unarmed. Tarsi of four anterior legs pale; hind legs with first segment very dark, second pale, others missing. T.R. nearly 3. On four anterior legs tarsi with fourth segment short, bell-shaped; claws unequal, longer talon about as long as fifth segment, shorter one half its length.

Abdomen mainly very dark brown or blackish, but with indications of paler, cream-coloured markings at edges of tergites ; cerci pale. Spermatheca obscured in the unique specimen.

Anglo-Egyptian Sudan. Rier, 8.ii.1946, 1 ♀, "on steamer at light" (*D. J. Lewis*).

As indicated in the description, this species resembles *A. wansoni* de Meillon, but would appear to be a larger and darker insect, and to differ more notably in having the thorax spotted, and in bearing fewer macrotrichia on the wings.

Group *Palpomyia*.

Palpomyia platyura sp. n.

A small almost black species with femora and tibiae of the four posterior legs uniformly dark brown, only the fore femora armed, and (on the fore legs at any rate) the fourth tarsal segment short but neither bilobed nor cordiform, and the fifth unarmed.

Male. Length of wing about 1·1 mm., greatest breadth about 0·3 mm.

Head almost black. Eyes apparently bare. Palpi brown : lengths of last three segments sub-equal, 8–9 units, third not inflated, without pit. Antennae with scanty pale brown plume, torus very dark, segments 3–12 pale brown but more or less infuscated apically, and segments 13–15 dark brown : segments 4–12 gradually increasing in size from 10 by 8 (maximum) to 22 by 7 (maximum) units ; 13 and 14 sub-equal, about 13–14 by 6–7 units 15 slightly longer (but not so long as 12), about 17 by 5–6 units, without stylet.

Thorax almost black, not narrowed anteriorly, without tubercle. Scutellum almost black but paler in middle, bearing a few small bristles and hairs.

Wings slightly milky, unadorned, without macrotrichia. Microtrichia minute. Veins colourless and not easy to trace, without bristles (excepting on costa). Anal lobe moderately developed. Costa extending beyond middle of wing (about two-thirds), bearing rather widely spaced, short bristles. Radial cells difficult to make out, but apparently two, both longer than broad. M 2 deficient at base but so far as can be seen probably sessile, and originating at or near level of cross-vein. Fork of Cu at about level of middle of first radial cell, the branches forming an acute angle. Halteres with blackish knobs.

2

Fig. 2.—*Palpomyia platyura* sp. n. : (*A*) ventral views of hypopygium of male, (*B*) clasper.

Legs unfortunately damaged, only the anterior pair complete. Fore-legs with femora and tibiae dark brown in middle but paler brown at both extremities, knees dark ; femora and tibiae of four posterior legs almost uniformly dark brown. Femora not swollen ; those of fore-legs armed with two spines on distal half, others unarmed. Tarsal segments pale brown, but distal units more or less infuscated. T.R. about 2. Fourth tarsal segment short but not bilobed or cordiform on fore and middle legs (others missing) ; fifth on fore-legs (others missing) not inflated, unarmed. Claws on fore-legs (others missing) small, equal. No empodium.

Abdomen very dark brown above, paler ventrally. Hypopygium blackish, very highly chitinised. Ninth tergite narrow, with a terminal pair of rather large, hairy processes (hairs not shown in figure). Side-pieces very broad, with scanty scattered bristles ; claspers in ventral view as shown in the figure (fig. 2, *B*). Aedeagus and harpes (fused) in ventral view as shown in the figure (fig. 2, *A*).

Anglo-Egyptian Sudan : Wad Medani, 28.i.1946, 1 ♂ "at light" (*H. W. B. Barlow*).

As this species, perhaps a *Sphaeromias*, cannot be placed exactly until further specimens are available and examples of both sexes, I leave it with the group diagnosis *Palpomyia* ; and I describe it only because the striking characters of the hypopygium should make the males easy to recognise again.

Group *Bezzia*.

Bezzia sp.

Rier, 8.ii.1946, 1 ♀.

Unfortunately this specimen is much damaged so that it is not now possible to determine even to what genus it belongs.

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1947

WEDNESDAY, October 1, 15

,, November 5, 19

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